RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 52-03-06

Log Event A

Borehole Information

Farm : TY	**Tank :** TY-103	**Site Number :** 299-W10-96
N-Coord : 42,452	**W-Coord :** 75,852	**TOC Elevation :** 670.93
Water Level, ft :	**Date Drilled :** 12/31/1971	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:
According to the drilling record, this borehole was not perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. The top of the casing, which is the zero reference for the SGLS, is approximately 0.8 ft below the tank farm grade.

Equipment Information

Logging System : 2	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1995	**Calibration Reference :** GJPO-HAN-3	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number : 1	**Log Run Date :** 4/30/1996	**Logging Engineer:** Alan Pearson
Start Depth, ft.: 100.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 0.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 5/1/1996	**Logging Engineer:** Alan Pearson
Start Depth, ft.: 90.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 75.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Analysis Information

Analyst : E. Larsen

Data Processing Reference : P-GJPO-1787 Analysis Date : 1/31/1997

Analysis Notes :

This borehole was logged by the SGLS in two log runs. One log run was required to complete the borehole. A second log run was performed as an additional quality assurance check on a segment of the primary log run.

The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides Cs-137 and Co-60 were detected in this borehole. The presence of Cs-137 was measured continuously from the ground surface to 5 ft, intermittently from 8.5 to 14.5 ft, and from 56 to 61 ft. The maximum Cs-137 concentration was about 1.5 pCi/g at the ground surface. A zone of relatively high concentrations of Co-60 was detected continuously from 54 to 100 ft (the total depth logged). The maximum Co-60 concentration was 36.8 pCi/g at a depth of 99.5 ft.

The KUT logs show an increase in the K-40 concentrations values at about 45 ft. The Th-232 and U-238 concentrations increase below about 90 ft.

In some areas between 55 and 100 ft (the total depth logged), the 609-keV peak used to assay the U-235 concentration was obscured by an elevated Compton continuum associated with the downscatter from the Co-60 peaks. As a result, it was not possible to identify many of the 609-keV peaks in these areas and the corresponding U-238 concentrations could not be determined.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks TY-103 and TY-105.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

The interval between 75 and 90 ft was relogged as an additional quality check and to demonstrate the repeatability of the radionuclide concentration measurements made by the SGLS. The radionuclide concentrations shown were calculated using the separate data sets provided by the original and rerun logging runs.

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Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A time-sequence plot was generated from representative historical gross gamma logs acquired between 1975 and 1994 and is presented with the SGLS logs.